THE WARREN ALPERT Medical School
BROWN UNIVERSITY

Curriculum Vitae

Date Prepared:	**October 6, 2024**
Name:	**Martin Samuel Taylor**
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Place of Birth:	**Baltimore, MD**

Education:

05/2005	BSE *Magna Cum Laude*	Chemical Engineering. Certificates: Computer Science, Spanish	Princeton University
05/2015	MD	Medicine	Johns Hopkins University School of Medicine
05/2015	PhD	Pharmacology. (Advisors: Drs. Philip Cole & Jef Boeke)	Johns Hopkins University School of Medicine

Postdoctoral Training:

07/2015-08/2018	Resident	Anatomic Pathology	Massachusetts General Hospital
07/2017-08/2018	Chief Resident & Subspecialty Training	Anatomic and Gastrointestinal Pathology	Massachusetts General Hospital
08/2018 – 08/2021	Visiting Postdoctoral Associate	Biochemistry, Cancer Biology, Cell Biology. Laboratory of David M. Sabatini	Whitehead Institute
08/2018-07/2021	Graduate Assistant in Pathology and Clinical Fellow	Anatomic Pathology	Massachusetts General Hospital
07/2021-07/2024	Instructor	Anatomic Pathology	Massachusetts General Hospital

Faculty Academic Appointments:

07/2021-	Instructor in Pathology	Pathology	Harvard Medical School
07/2024-	Assistant Professor	Pathology and Laboratory Medicine	Brown University

Appointments at Hospitals/Affiliated Institutions:

07/2015 – 08/2018	Resident Physician, Anatomic Pathology	Pathology	Massachusetts General Hospital
07/2017 – 08/2018	Chief Resident, Anatomic Pathology & Subspecialty training, Gastrointestinal Pathology	Pathology	Massachusetts General Hospital
08/2018 – 06/2024	Graduate Assistant	Pathology	Massachusetts General Hospital
08/2018 – 06/2024	Clinical Fellow	Pathology	Harvard Medical School
07/2024-	Assistant Pathologist	Pathology	Lifespan Health / Brown University

Other Appointments

2023-2024	Member	SPORE in Gastrointestinal Cancer	Dana Farber / Harvard Cancer Center
2021 –	Visiting Scientist	Department of Pathology	Dana Farber Cancer Institute
2023 –	Visiting Scientist		Broad Institute of MIT and Harvard

Committee Service:

Local

2017-2019	Department of Pathology Grand Rounds Committee	Massachusetts General Hospital

International

2020-2021	Doctoral Thesis Committee, María Benítez Guijarro, laboratory of Dr. José Luis García Pérez	GENYO - Centro Pfizer-Universidad de Granada-Junta de Andalucía de Genómica e Investigación Oncológica, Granada, Spain. Thesis Committee Member
2023-	Doctoral Thesis Committee, Gerard Mingarro Broch, laboratory of Dr. Marc Güell	Universitat Pompeu Fabra, Barcelona, Spain. Thesis Committee Member
2023-	Doctoral Thesis Committee, Apostolis Mourtzinos, laboratory of Dr. John LaCava	University Medical Center Groningen, Groningen, Netherlands. Thesis Committee Member

Professional Societies:

2015-present	United States and Canadian Academy of Pathology (USCAP)	Member
2020-present	American Society for Clinical Pathology (USCAP)	Member

Grant Review Activities:

2019	Medical Research Foundation (UK)	Ad hoc reviewer, Viral & Autoimmune Hepatitis program
2023-	Cancer Community Awards	Judge

Editorial Activities:

- **Ad hoc Reviewer**

eLife, Journal of Clinical Pathology, Cell Stem Cell, Cancer Research, Science Advances, Antimicrobial Agents and Chemotherapy

Honors and Prizes:

2004	Summer Medical Student Award	American Society of Hematology	Recognition for basic science research
2004, 2005	Tau Beta Pai Member, First Election	Princeton University	Academic achievement as an undergraduate
2005	Myers Award	Princeton University Track and Field	Scholarship, athletic performance, and character
2005	Merck and Company Outstanding Senior Thesis Award	Princeton University Chemical Engineering	Recognition for basic science research
2005-2015	Medical Scientist Training Program	NIH / The Johns Hopkins University School of Medicine	Training award for doctoral research and medical training
2011	Outstanding Presentation Prize	Department of Molecular Biology and Genetics, The Johns Hopkins University School of Medicine	Recognition for basic science research on ghrelin
2014	The Outstanding Abstract in Basic Research, Pathology Young Investigators' Day,	Department of Pathology, the Johns Hopkins University School of Medicine	Recognition for basic science research on LINE-1
2014	Ehrlich Award	The Johns Hopkins University School of Medicine	Award given for thesis research on ghrelin
2015	Pathology Young Investigators' Day Award	The Johns Hopkins University School of Medicine	Recognition for basic science research on LINE-1
2017-2018	Chief Resident, Anatomic Pathology	Department of Pathology, Massachusetts General Hospital	
2018	Stowell Orbison Award	United States & Canadian Academy of Pathology	Award given by judges for best presentation by a trainee
2018	Poster of Distinction, Pathology Annual Retreat	Harvard Medical School	Recognition for translational research on two topics: LINE-1 and respiratory failure
2018 – 2021	NIH T32 Awardee	T32CA009216	Training award for postdoctoral research

2021-	NIH K08 Awardee	K08DK129824	Career development award for physician-scientists ($800,000 direct costs)
2022-2024	Incubator Awards	Dana Farber /Harvard Cancer Center	$500,000 direct costs. For translational LINE-1 work.
2023	Developmental Project Award in Gastrointestinal Cancer	Dana Farber /Harvard Cancer Center GI SPORE	$50,000 direct costs. Recognition of translation LINE-1 work.
2024	SU2C Maverick Early Career Scientist Award	Stand Up To Cancer	$100,000 direct costs. Recognition for basic and translational work LINE-1 in cancer as a biomarker and contributor to pathology

Training Grants and Mentored Trainee Grants

2005-2015	Medical Scientist Training Program, Johns Hopkins University School of Medicine
2008-2021	T32 CA009216, Molecular Immunology and Tumor Biology, Massachusetts General Hospital

Report of Local Teaching and Training

Teaching of Students in Courses:

2007-2009	Histology	Johns Hopkins University School of Medicine
	Medical Students	Teaching assistant for this course, two years. Responsibilities included leading small group lectures and discussions, supervising laboratory/microscope sessions, and two formal ~20 minute lectures per year on histologic manifestation of disease.

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs):

2018	Chief Resident	Massachusetts General Hospital
	MGH Pathology residents	Established morning teaching conference series, recruited faculty to teach and co-taught 1 day per week for 6 months
2018-2023	MGH Pathology Outs Series	Massachusetts General Hospital
	MGH Pathology residents and fellows	1 hour presentations 1-2 times a year

Clinical Supervisory and Training Responsibilities:

2018-2024	Supervision of residents and clinical fellows	Massachusetts General Hospital

	Pathology residents and fellows	6-12 weeks per year on the gastrointestinal and liver pathology services
2024-	Supervision of residents and clinical fellows	Brown University / Lifespan Health
	Pathology residents and fellows	6-12 weeks per year on the gastrointestinal and liver pathology services

Other Mentored Trainees and Faculty:

2010-2013 Po-Yuan (Robert) Hsaio, PhD / Associate Partner, McKinsey & Co., Los Angeles, CA

Mentored Robert as new graduate student in the Cole Lab, Johns Hopkins University, while I was a senior student, where I was responsible for his day-to-day experimentation and training as he built on biochemical and probe development aspects of our ghrelin project. I helped teach Robert to design experiments and new probes, and he developed mastery of a challenging integral membrane protein assay system. Troubleshooting and extending here provided an excellent foundation for his aspirations in business.

2011-2013 Emily Adney-Holt, PhD / Technical Sales Specialist, Lunaphore Technologies

Mentored Emily as a graduate student in the Boeke Lab, Johns Hopkins University, while I was a senior graduate student / "postdoc" working on LINE-1. Emily had switched graduate programs after a bad experience in a prior lab, and I was responsible for day-to-day training and helping her find a path forward in science. I helped her find a home in the lab and she went on to conclude an important body of work for our field in her thesis.

2014- Daniel Ardeljan, MD, PhD / Clinical Fellow in Heme/Onc, Dana Farber Cancer Institute, Postdoc, Golub Lab, Broad Institute

Recruited Daniel to Burns Lab as an MD/PhD student while on OB/Gyn medical rotation together. Provided initial training in Burns lab and helped him define his thesis work. I have continued to be an informal mentor throughout and am currently helping him think through postdoc projects. Daniel is a rising star in academic medicine.

2014-2015 David Husband, MD / Fellow, Hospice and Palliative Medicine, Atrium Health

Recruited and supervised David as a technician in Burns Lab and mentored him through the application process and transition to medical school. Now a successful physician.

2019 Anna Platzek, MS / Graduate student, Max Planck, Germany

Supervised Anna in Sabatini Lab as Master's Student for her thesis project from Goethe-University, Mrankfurt am Main, Germany. In this work, she learned to design and perform Crispr endogenous editing to tag mTOR pathway components and study them using interactomics. She generated key cell lines and launched an important project for our group, and with the skills she learned was able to apply for a top-notch PhD in Germany.

2020 – 2022 Daniel Freund, BS

Recruited Daniel to Sabatini Lab as Bachelor student, University of Veterinary Medicine, Vienna, Austria. Mentored and supervised him in his Bachelor's thesis, which was finished virtually over the pandemic, focusing on mTORC2 function and interactors. Supported him through difficult personal times over the pandemic and in transitions.

2020 – 2022 Kaay Matas, MS / Master's Student, bioinformatics, Radboud University

Recruited Kaay to Sabatini Lab as a Master student, Radboud University, Netherlands. Mentored and supervised his Master thesis, focused on lysosomal function, proteomics, and inhibition of lysosomal proteases. Two part internship before and after pandemic restrictions forced him to return to Netherlands; we offered virtual completion but he wanted to return to learn additional cell culture and interactomic techniques. I continue to mentor Kaay as he now finishes a second computation Master's and plans a PhD.

2020-2021 Samantha Congreve, MS / Engineer, Novavax, Uppsala, Sweden

Recruited Samantha to Sabatini Lab as a Master student, Uppsala University, Sweden. Mentored and supervised her Master thesis, focused on mTORC2 structure and function. She had a strong theoretical background bud never used a pipet and wanted to learn bench science; she quickly learned to the intricacies of complex multi-step purifications and design signaling experiments. This experience enabled her to pursue jobs in biotechnology.

2021 – 2023 Kera Xibinaku, MSc

Recruited Kera to Sabatini Lab as a Master student, FH Technikum Wien, Vienna, Austria. Kera came with ~10 years industry experience and wanted a challenge, and I mentored and supervised her Master thesis where she developed complex dissections and in vivo biochemistry to make study of lysosomal composition and signaling in the intestine a routine effort for us. Secured her a completion of her position and project in Yilmaz lab after closure of Sabatini Lab.

2021 – 2022 Maximiliaan Hennink, MS / PhD student, Erasmus University, Rotterdam, Netherlands
Recruited Max to Sabatini Lab as a Mater Student, Radboud University, Netherlands, and I mentored and supervised his Mater thesis where he studied mTORC1 and mTORC2 function and developed structure-quality purifications of both, having before never purified a protein. Mentored through transition to graduate school and selection of projects and next fields of interest.

2019- Maggie Chen, BS / Graduate Student, Cole Lab, Harvard Medical School

I have mentored, supervised, and closely collaborated with Maggie as we built her thesis project together on understanding mTORC2 activation of Akt and other AGC kinases. She has become a highly skilled biochemist, enzymologist, and scientific writer under my joint mentorship with Phil Cole and now has the tools to devise and study new questions.

2022-2024 Bryant Miller, MD-PhD student, Johns Hopkins University School of Medicine

Recruited Bryant as my technician as he was completing his undergraduate thesis in Cole Lab and was uncertain whether to pursue science, medicine, or both. He made key contributions to multiple projects on mTORC2 and LINE-1 function and mechanisms, including an important co-first authorship and second authorship.

2023- Apostolos Mourtzinos, BS / Graduate Student, LaCava Lab, Graduate School of Medical Sciences, UMCG, Netherlands

Co-supervisor for Apostolos's thesis work on LINE-1 and autoimmunity.

Invited Teaching and Presentations

☒ *No presentations below were sponsored by 3rd parties/outside entities*

☐ *Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.*

Local Invited Presentations:

2014	"Affinity proteomics reveals human host factors implicated in discrete stages of LINE-1 retrotransposition." Johns Hopkins Pathology Grand Rounds.
2022	"Structural, mechanistic, and allosteric determinants of mTOR Complex 2 (mTORC2) activation of Akt" Chemical Biology Supergroup, Broad Institute
2023	"The LINE-1 Retrotransposon: Emerging Roles as a Biomarker and in the Carcinogenesis of Gynecologic Malignancy" MGH Vincent Center for Reproductive Biology Seminar Series, Boston MA.
2023	"LINE-1: a Multi-Cancer Biomarker & Cancer Target." Harvard Cancer Signaling Meeting, Boston, MA
2024	"Structures and Mechanisms of LINE-1: an Emerging Biomarker & Therapeutic Target". Public job talk seminar. Brigham and Women's Pathology, Boston, MA.
2024	"Understanding, Targeting, and Exploiting the LINE-1 Transposon for Cancer Detection, Prevention, and Therapy". Cancer Biology Program Meeting, Legorreta Cancer Center at Brown University
2024	"The Human LINE-1 Retrotransposon: a Targetable Contributor to Carcinogenesis?" Invited seminar speaker. Gastrointestinal (GI) cancer Translational Research Disease Group, Brown University, Providence, RI
2024	"Structures and Mechanisms of Cytosolic cDNA Synthesis and Innate Immune Activation by Human LINE-1 ORF2p Reverse Transcriptase" Invited talk. Brown University Center on the Biology of Aging Retreat
2024	"LINE-1: an Emerging Biomarker & Therapeutic Target in Carcinogenesis and Cancer". Invited talk. Legorreta Cancer Center Annual Membership Retreat, Brown University, Providence, RI

Regional Invited Presentations:

2023	"Structure, Function, and Ultrasensitive Detection of the Human LINE-1 Retrotransposon: a Multi-Cancer Biomarker & Potential Therapeutic Target". Invited seminar speaker. Brown University Biology of Aging / Legorreta Cancer Center Seminar, Providence, RI.
2023	"Structures and Mechanisms of LINE-1: an Emerging Biomarker & Therapeutic Target". Public job talk seminar. Memorial Sloan Kettering Structural Biology Program, New York NY
2024	"Structures and Mechanisms of LINE-1: an Emerging Biomarker & Therapeutic Target". Public job talk seminar. Brown University Pathology and Laboratory Medicine, Providence, RI.
2024	"Structures and Mechanisms of LINE-1: an Emerging Biomarker & Therapeutic Target". Public job talk seminar. Fred Hutch Met-X, Seattle, WA.

2024 "Structures and Mechanisms of LINE-1: an Emerging Biomarker & Therapeutic Target". Public job talk seminar. UTSW Pathology, Dallas, TX.

2024 "Structures and Mechanisms of Cytosolic cDNA Synthesis and Innate Immune Activation by Human LINE-1 ORF2p Reverse Transcriptase". Invited speaker. New England Senescence Symposium, Boston University.

National Invited Presentations:

2012 "The Transposon-Host interactome: Identification of binding partners in LINE-1 RiboNucleoProtein Complex" Talk.
Meeting of The Centers for Networks and Pathways (NIH TCNP, Bethesda, MD)

2012 "The Transposon-Host interactome: Identification of binding partners in LINE-1 RiboNucleoProtein Complex" Invited talk.
National Center for Dynamic Interactome Research Meeting (Institute for Systems Biology, Seattle, WA).

2013 "How Do Vertebrates Make a Fatty Octanoyl PTM? Architecture of the Metabolic Regulatory Enzyme Ghrelin-O-Acyltransferase (GOAT)". Talk.
Meeting of The Centers for Networks and Pathways (NIH TCNP, Bethesda, MD).

2024 "Stomach cancer trials, chemotherapy, biomarkers, and transposons: future opportunities". Talk.
Hope for Stomach Cancer 2nd Stomach Cancer Patient Empowerment Summit, Arlington, VA

2024 Using and targeting the "dark genome" in cancer early detection and prevention. Talk.
Hope for Stomach Cancer 2nd Stomach Cancer Patient Empowerment Summit, Arlington, VA, USA

2025 Advancing Gastric Cancer Research: From Biomarkers to Future Therapeutics
Hope for Stomach Cancer 3nd Stomach Cancer Patient Empowerment Summit, Arlington, VA, USA

International Invited Presentations:

2023 "LINE-1 ORF2 structure and biochemistry"
Transposable elements at the crossroad of health and disease, McGill University hosted International Meeting, Bellairs.

2023 "Ultrasensitive detection of circulating LINE-1 ORF1p as a specific multi-cancer biomarker."
Stand Up To Cancer (SU2C) Scientific Summit, San Diego, CA.

2023 "Structural analysis and inhibition of human LINE-1 ORF2 protein reveals novel adaptations and functions". Selected talk from abstracts.
Transposable Elements at the Crossroads of Evolution, Health and Disease, Whistler, Canada.

2023 "Structures, functions, and evolution of the human LINE-1 ORF2 protein". Invited talk.
EMBO Workshop, The mobile genome: genetic and physiological impacts of transposable elements, Heidelberg, Germany

2023 "Structures, functions, and cytosolic cDNA synthesis by the LINE-1 ORF2 protein". Invited talk

2nd Annual Dark Genome Symposium, Crick Institute, London, UK.

2024 "Structures, Mechanisms, and Ultrasensitive Detection in Plasma of LINE-1: an Emerging Multi-Cancer Early Detection Biomarker & Therapeutic Target".
Stand Up To Cancer (SU2C) Scientific Summit, San Diego, CA. *This talk was selected from posters and led to selection for the 2024 SU2C Maverick junior investigator award*.

2024 "Structures, Functions, and Adaptations of the Human LINE-1 ORF2 Protein: an Emerging Therapeutic Target". Talk.
International Congress on Transposable Elements, St. Malo, France

Report of Clinical Activities and Innovations

Past and Current Licensure and Board Certification:

2018	MA State Medical License
2018	Diplomate, Anatomic Pathology, American Board of Pathology

Practice Activities:

2018-2024	Attending Gastrointestinal Pathologist	Massachusetts General Hospital	6-12 weeks / year. Both general GI and liver services.
2024-	Attending Gastrointestinal Pathologist	Brown University / Lifespan Health	6-12 weeks / year. Both general GI and liver services.

Clinical Innovations:

2018-2021	As a resident, I co-discovered a novel pattern of severe acute lung injury, which we termed diffuse alveolar injury with delayed epithelization (DAIDE). After description of the injury in two publications, I became aware of cases with similar presentation, and connected with Drs. Goldman and Miller at Children's Mercy in Kansas. We together demonstrated that this novel form of acute lung injury was a rare, severe adverse reaction caused by the common antibiotic trimethoprim/sulfamethoxazole (TMP/SMX, Bactrim). Our efforts together to describe and spread understanding of this toxicity has led to a new FDA "black box warning" issuing caution of the risk of severe pulmonary disease or death, along with new clinical practice guidelines recently published in Critical Care Med (PMID 37449964).

Report of Technological and Other Scientific Innovations

2005	Janak SL, Taylor MS, Floudas CA, Burka M and Mountziaris TJ, "A Novel and Effective Integer Optimization Approach for the NSF Panel Assignment Problem: A Multi-Resource and Preference-Constrained Generalized Assignment Problem", (US Patent Application)
2022-	Conception, co-invention, and lead development of ultrasensitive assays for LINE-1 ORF1p for use in plasma and other fluids. This protein biomarker is a pan-carcinoma, and potentially 'pan-cancer' biomarker with potential utility demonstrated in early detection, prognostic, and monitoring applications in

cancer; developing is ongoing for clinical utility in plasma and stool. US patent applied 29618-0364P02.

Report of Education of Patients and Service to the Community

☒ *No presentations below were sponsored by 3rd parties/outside entities*

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Activities

2020	Whitehead Institute magazine
	Featured in "Bridging research and medicine: Whitehead Institute's physician-scientists", [https://wi.mit.edu/news/bridging-research-and-medicine-whitehead-institute-s-physician-scientists]
2023	Mass General Brigham and Wyss Institute communications
	Featured in public / press release "Ultrasensitive Blood Test Detects 'Pan-Cancer' Biomarker", [https://wyss.harvard.edu/news/ultrasensitive-blood-test-detects-pan-cancer-biomarker/]
2024	Hope for Stomach Cancer
	Served as a panelist and patient resource at the 2024 2nd annual Patient Empowerment Summit, Washington DC

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. Janak SL, **Taylor MS**, Floudas CA, Burka M, and Mountziaris TJ. *"Novel and Effective Integer Optimization Approach for the NSF Panel-Assignment Problem: A Multiresource and Preference-Constrained Generalized Assignment Problem."* **Industrial and Engineering Chemistry Research** No. 45, pp 258-265 (2006).
2. Fung, HK, **Taylor MS**, and Floudas CA, *"Novel Formulations for the Sequence Selection Problem in de Novo Protein Design with Flexible Templates."* **Optimization Methods and Software** Vol. 22, No. 1 51-71 (2007).
3. Fung, HK, **Taylor MS**, Floudas CA, Zhang L, and Morikis D. *"Towards Full-Sequence De Novo Protein Design with Flexible Templates for Human Beta-Defensin-2."* **Biophysical Journal** No. 94(2):584-99 (2008). PMC2157230.
4. Floudas C.A, Fung H.K., Morikis D., **Taylor MS**., and L. Zhang, "*Overcoming the Key Challenges in De Novo Protein Design: Enhancing Computational Efficiency and Incorporating True Backbone Flexibility",* **Proceedings of BIOMAT VI**, Ed. R. Mondaini, Springer, 102, 133-183 (2008).
5. **Taylor MS**, Fung HK, Rajgaria R, Filizola M, Weinstein H, and Floudas CA. "*Mutations Affecting the Oligomerization Interface of G-Protein Coupled Receptors Revealed by a Novel De-novo Protein Design Framework.*" **Biophysical Journal** No. 94(7):2470-81 (2008). PMC2267121

6. Bellows ML, Fung HK, **Taylor MS**, Floudas CA, López de Victoria A, Morikis D. "*New compstatin variants through two de novo protein design frameworks."* **Biophysical Journal**. No. 98 (10):2337-46 (2010). PMC2872270.

7. Bellows ML*****, **Taylor MS***, Cole PA, Shen L, Siliciano RF, Fung HK, Floudas CA. "*Discovery of entry inhibitors for HIV-1 via a new de novo protein design framework.*" **Biophysical Journal** No. 99(10):3445-53 (2010). **[*Equal contribution shared first authorship].** PMC2980751.

8. Barnett BP*****, Hwang Y*****, **Taylor MS***, Kirchner H, Pfluger PT, Bernard V, Lin YY, Bowers EM, Mukherjee C, Song WJ, Longo PA, Leahy DJ, Hussain MA, Tschöp MH, Boeke JD, Cole PA. "*Glucose and weight control in mice with a designed ghrelin O-acyltransferase inhibitor*." **Science** No. 330(6011):1689-92 (2010). **[*Equal contribution shared first authorship].** PMC3068526

9. Dai L, **Taylor MS**, O'Donnell KA, Boeke JD. *"Poly(A) binding protein C1 is essential for efficient L1 retrotransposition and affects L1 RNP formation."* **Mol Cell Biol**. 32(21):4323-36 (2012). PMC3486150.

10. Smadbeck J, Peterson MB, Khoury GA, **Taylor MS**, Floudas CA. "*Protein WISDOM: A Workbench for In silico De novo Design of BioMolecules.*" **J. Vis. Exp.** (77), e50476, (2013). PMC3846368

11. Mitchell LM*****, Cai Y*****, **Taylor MS***, Noronha AM, Chuang J, Dai L, Boeke JD. *"Multichange Isothermal Mutagenesis: a new strategy for multiple site-directed mutations in plasmid DNA."* **ACS Synth. Biol**, No. 2(8):473-7(2013) **[*Equal contribution shared first authorship].** PMC4040258.

12. **Taylor MS**, Ruch TR, Hsiao PY, Hwang Y, Zhang P, Dai L, Huang CR, Berndsen CE, Kim MS, Pandey A, Wolberger C, Marmorstein R, Machamer C, Boeke JD, Cole PA. *"Architectural Organization of the Metabolic Regulatory Enzyme Ghrelin-O-Acyltransferase."* **J Biol Chem.** 288(45):32211-32228 (2013). PMC3820860.

13. **Taylor MS*,** LaCava J*, Mita P, Molloy KR, Huang CRL, Li D, Adney EM, Jiang H, Burns KH, Chait BT, Rout MP, Boeke JD, Dai L*, "*Affinity proteomics reveals human host factors implicated in discrete stages of LINE-1 retrotransposition.*" **Cell.** 155(5):1034-1048 (2013). PMC3904357.

14. Rodić N, Sharma R, Sharma R, Zampella J, Dai L, **Taylor MS**, Hruban RH, Iacobuzio-Donahue CA, Maitra A, Torbenson MS, Goggins M, Shih LM, Duffield AS, Montgomery EA, Gabrielson E, Netto GJ, Lotan TL, De Marzo AM, Westra W, Binder ZA, Orr BA, Gallia GL, Eberhart CG, Boeke JD, Harris CR, Burns KH, *"Long INterspersed Element-1 Protein Expression is a Hallmark of Many Human Cancers."* **Am J Pathol.** 184(5):1280-6 (2014). PMC4005969.

15. Chiang MJ, Holbert MA, Kalin JH, Ahn YH, Giddens J, Amin MN, **Taylor MS**, Collins SL, Chan-Li Y, Waickman A, Hsiao PY, Bolduc D, Leahy DJ, Horton MR, Wang LX, Powell JD, Cole PA, *"An Fc domain protein-small molecule conjugate as an enhanced immunomodulator."* **J Am Chem Soc**. 136(9):3370-3 (2014). PMID: 24533830. PMC3954559.

16. Dai L, LaCava J, **Taylor MS**, Boeke JD, *"Expression and detection of LINE-1 ORF-encoded proteins."* **Mob Genet Elements**. 2014 May 22;4:e29319. PMID: 25054082. PMC4091050.

17. Prusevich P, Kalin JH, Ming SA, Basso M, Givens J, Li X, Hu J, **Taylor MS**, Cieniewicz AM, Hsiao PY, Huang R, Roberson H, Adejola N, Avery LB, Casero RA Jr, Taverna SD, Qian J, Tackett AJ, Ratan RR, McDonald OG, Feinberg AP, Cole PA, *"A Selective Phenelzine Analogue Inhibitor of Histone Demethylase LSD1."* **ACS Chem Biol.** 20;9(6):1284-93 (2014). PMC4076021.

18. **Taylor MS**, Dempsey DR, Hwang Y, Chen Z, Chu N, Boeke JD, Cole PA, *"Mechanistic analysis of ghrelin-O-acyltransferase using substrate analogs."* **Bioorg Chem.** 2015 Oct;62:64-73. PMID: 26246082. PMC4567917.

19. LaCava J, Molloy KR, **Taylor MS**, Domanski M, Chait BT, Rout MP, *"Affinity proteomics to study endogenous protein complexes: Pointers, pitfalls, preferences and perspectives."* **Biotechniques**. 2015 Mar 1;58(3):103-19. PMC4465938.

20. Rodić N, Steranka JP, Makohon-Moore A, Moyer A, Shen P, Sharma R, Kohutek ZA, Huang CR, Ahn D, Mita P, **Taylor MS**, Barker NJ, Hruban RH, Iacobuzio-Donahue CA, Boeke JD, Burns KH. *"Retrotransposon insertions in the clonal evolution of pancreatic ductal adenocarcinoma."* **Nat Med.** 2015 Sep;21(9):1060-4. PMC4775273.

21. Ardeljan D, Taylor MS, Burns KH, Boeke JD, Espey MG, Woodhouse EC, Howcroft TK. "*Meeting Report: The Role of the Mobilome in Cancer.*" **Cancer Res.** 2016 Aug 1;76(15):4316-9. PMID: 27527733

22. Ardeljan D, **Taylor MS**, Ting DT, Burns KH. *"The Human Long Interspersed Element-1 Retrotransposon: An Emerging Biomarker of Neoplasia."* **Clin Chem.** 2017 Apr;63(4):816-822. PMID: 28188229

23. Roper J, Tammela T, Cetinbas NM, Akkad A, Roghanian A, Rickelt S, Almeqdadi M, Wu K, Oberli MA, Sánchez-Rivera F, Park YK, Liang X, Eng G, **Taylor MS**, Azimi R, Kedrin D, Neupane R, Beyaz S, Sicinska ET, Suarez Y, Yoo J, Chen L, Zukerberg L, Katajisto P, Deshpande V, Bass AJ, Tsichlis PN, Lees J, Langer R, Hynes RO, Chen J, Bhutkar A, Jacks T, Yilmaz ÖH. *"In vivo genome editing and organoid transplantation models of colorectal cancer and metastasis."* **Nat Biotechnol**. 2017 May 1. doi: 10.1038/nbt.3836. PMID: 28459449

24. Miller CL, **Taylor MS**, Qadan M, Deshpande V, Worthington S, Smalley R, Collura C, Ryan DP, Allen JN, Blaszkowsky LS, Clark JW, Murphy JE, Parikh AR, Berger D, Tanabe KK, Lillemoe KD, Ferrone CR. *"Prognostic Significance of Surgical Margin Size After Neoadjuvant* FOLFOX and/or FOLFIRI for Colorectal Liver Metastases." J Gastrointest Surg. 2017 Nov;21(11):1831-1840. PMID: 28884391.

25. **Taylor MS***, Chivukula RR*, Myers LC, Jeck WR, Tata PR, O'Donnell WJ, Farver CF, Thompson BT, Rajagopal J, Kradin RL. "*Delayed Alveolar Epithelization: A Distinct Pathology in Diffuse Acute Lung Injury."* **Am J Respir Crit Care Med**. 2018 Feb 15; 197(4):522-524. PMID: 28696778.

26. **Taylor MS***, Altukhov I*, Molloy KR*, Mita P, Jiang H, Adney EM, Wudzinska A, Badri S, Ischenko D, Eng G, Burns KH, Fenyö D, Chait BT, Alexeev D, Rout MP, Boeke JD, LaCava J. *"Dissection of affinity captured LINE-1 macromolecular complexes."* **eLife**. 2018 Jan 8;7. PMID 29309035

27. **Taylor MS***, Chivukula RR*, Myers LC, Jeck WR, Waghray A, Tata PR, Selig MK, O'Donnell WJ, Farver CF, Thompson BT, Rajagopal J, Kradin RL. "*A Conserved Distal Lung Regenerative Pathway in Acute Lung Injury.*" **Am J Pathol**. 2018 Feb 21. PMID: 29476724.

28. Farago AF*, **Taylor MS***, Doebele RC, Zhu VW, Kummar S, Spira AI, Boyle TA, Haura EB, Arcila ME, Benayed R, Aisner DL, Horick NK, Lennerz JK, Le LP, Iafrate AJohn, Ou SI, Shaw AT, Mino-Kenudson M, Drilon A. "*Clinicopathologic Features of Non–Small-Cell Lung Cancer Harboring an NTRK Gene Fusion."* **JCO Precision Oncology** 2018:2, 1-12. PMID: 30215037. PMCID: PMC6590674

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Non-peer reviewed scholarship in print or other media:

Reviews, chapters, and editorials

1. **Taylor MS**, Hwang Y, Hsiao PY, Boeke JD, Cole PA. *"Ghrelin O-acyltransferase assays and inhibition."* **Methods Enzymol.** 514:205-28. Review (2012). PMC3763810.
2. Sharma R, Rodić N, Burns, KH, **Taylor MS**, *"Immunodetection of Human LINE-1 Expression in Cultured Cells and Human Tissues"* in: *Transposons and Retrotransposons: Methods and Protocols*, 261-280. J. L. Garcia Perez, (Ed.) Springer: 2016.
3. **Taylor MS,** LaCava J, Dai L, Mita P, Burns KH, Rout MP, Boeke JD, *"Characterization of L1-ribonucleoprotein particles"* in: *Transposons and Retrotransposons: Methods and Protocols*, 311-338. J. L. Garcia Perez, (Ed.) Springer: 2016.
4. Di Stefano LH, Saba LJ, Oghbaie M, Jiang H, McKerrow W, Benitez-Guijarro M, **Taylor MS**, LaCava J. *"Affinity-Based Interactome Analysis of Endogenous LINE-1 Macromolecules."* Methods Mol Biol. 2023;2607:215-256. doi: 10.1007/978-1-0716-2883-6_12. PMID: 36449166

Case reports

1. Ho J, Mahajan J, **Taylor MS**, Byers A, Arauz P, Kwon YM. *"Metallosis in cemented titanium alloy total knee arthroplasty without apparent metal-on-metal articulation."* **Knee.** 2018 Aug;25(4):728-731. PMID: 29776814
2. Liang NE, **Taylor MS**, Ferrone CR. "*A Rare Case of Gallbladder Small Cell Carcinoma."* J Gastrointest Surg. 2021 Feb;25(2):561-564. doi: 10.1007/s11605-020-04620-8. Epub 2020 May 11. PMID: 3239412

Thesis:

Taylor, M. S. (2015). *Inhibition, Structure, and Function of Ghrelin-O-Acyltransferase* (Doctoral dissertation, Johns Hopkins University). Retrieved from [https://jscholarship.library.jhu.edu/items/1066846c-2dd0-4301-bd32-0690c8ad5f58]

Abstracts, Poster Presentations, and Exhibits Presented at Professional Meetings:

1. 2011 Meeting of The Centers for Networks and Pathways (NIH TCNP, Bethesda, MD). Poster: *"Glucose and Weight Control in Mice with a Designed Ghrelin O-Acyltransferase (GOAT) Inhibitor and Studies on the Structure and Function of GOAT"*

2. 2012 Meeting of The Centers for Networks and Pathways (NIH TCNP, Bethesda, MD). Poster: "*GOAT Topology: Architecture of a Weight Regulatory Peptide Octanoyltransferase"*
3. 2014 April 17, Johns Hopkins Young Investigators Day. Poster: *"Afinity Proteomics Reveals Human Host Factors Implicated in Discrete Stages of LINE-1 Retrotransposition."*
4. 2016 March 14, United States and Canadian Academy of Pathology Meeting (USCAP, Seattle, WA). Poster "LINE-1 RNA and ORF1p Protein are Broadly Expressed in Colon Cancer."
5. 2017 June 19. FASEB Mobile DNA in Mammalian Genomes Meeting (Big Sky, MT). Poster "LINE-1 RNA-ISH and ORF1p IHC are promising biomarkers in Colorectal & Esophageal Cancers"
6. 2018 March 19, United States and Canadian Academy of Pathology Meeting (USCAP, Vancouver, BC, Canada). Poster. "LINE-1 RNA In-Situ Hybridization and ORF1p Immunohistochemistry are Useful Adjuncts in Diagnosing Dysplasia in Barrett's Esophagus and LINE-1 Up-Regulation Appears to be an Early Event in Esophageal Carcinogenesis."
7. 2018 March 19, United States and Canadian Academy of Pathology Meeting (USCAP, Vancouver, BC, Canada). Poster. "Immune-based Stratification of Colon Cancer Predicts Survival." *_This poster was selected for the Stowell-Orbison Award_.*
8. 2023 September 8, Transposable Elements at the Crossroads of Evolution, Health and Disease, Whistler, Canada. Poster. "Structural analysis and inhibition of human LINE-1 ORF2 protein reveals novel adaptations and functions".
9. 2024 January 28, Stand Up To Cancer (SU2C) 2024 Scientific Summit. Poster. "Structures, Mechanisms, and Ultrasensitive Detection in Plasma of LINE-1: an Emerging Multi-Cancer Early Detection Biomarker & Therapeutic Target". *This poster and subsequent talk led to selection for the 2024 SU2C Maverick junior investigator award.*

Funded Grants

1	2019-2021	Protein interactions mediate the contribution of LINE-1 retrotransposons to cancer development Worldwide Cancer Research - Research Project Grant Co-investigator. (John LaCava, PI) I co-wrote this grant, the goal of which was to investigate a potential causative a role for protein-protein interaction dysregulation in the L1/cancer relationship, with a focus on physical and functional relationship between L1 and IGF2BP1. We also used mass spectrometry techniques to profile L1 and its interactors in colorectal cancers I banked.
2	2020	Understanding lysosomal defects in epithelial and innate immune autophagy that lead to inflammatory bowel disease. Kenneth Rainin Foundation Innovator Award Co-investigator. $200,000 direct costs (David Sabatini, PI) I wrote this grant in the Sabatini lab to biochemically characterize lysosomal defects in mouse and cellular models of Crohn's disease with defects in autophagy, to build these tools to allow study of lysosomes in IBD, and to study lysosomal composition and differences in normal and diseased epithelial cells and macrophages. The underlying goal was to identify causal molecular defects in the pathogenesis of IBD.
3	2021-2026	Elucidating Structural, mechanistic, and allosteric determinants of mTOR Complex 2 (mTORC2) Signaling. NIH NIDDK K08 DK129824 PI – Direct costs $800,000 This career development award for postdoctoral training in the Sabatini and Cole Labs seeks to reveal the structural basis of recognition and activation of Akt and other substrates by mTORC2 and determine how mTORC2-substrate interactions are modulated by allosteric interacting proteins.
4	2022	Defining molecular contributions of LINE-1 retrotransposons to AD / ADRD NIH NIA R01 AG078925 Co-investigator (John LaCava and John Sedivy, co-PIs, $782,000 total direct costs) The goals of this project are to profile LINE-1 protein expression and interacting proteins and nucleic acids in neurodegeneration, senescent cells, and iPSCs
5	2022-2024	Development of an Ultrasensitive Blood Test for LINE-1 ORF1p for Ovarian and Esophageal Cancer Detection DF/HCC Incubator Award Program Co-Investigator ($250,000 direct costs; PIs K. Burns, D. Ting, B. Rueda, S. Klempner, S. Skates) I wrote this collaborative grant to help build a consortium across Dana Farber and Mass General to develop our plasma ORF1p biomarker assays towards clinical utility in gastrointestinal and ovarian cancers, with aims covering both assay development and bioinformatic approaches. This group just published our first paper (Taylor et al, 2023 Cancer Discovery) and development is ongoing.
6	2020-2024	Gastric Cancer Interception Research Team, Early Detection and Interception of Diffuse and Intestinal Gastric Cancer Stand Up To Cancer Co-investigator (Andy Chan, PI, $3,000,000 total direct costs) This supports our international team of experts that will take a new approach to fighting gastric cancer, the world's third-leading cause of cancer death. The Research Team will conduct intensive studies to identify biomarkers for the early detection of gastric cancer; I lead our studies on ORF1p, which is now our leading biomarker.

7 2023 Development of Ultrasensitive Blood Tissue, and Stool Tests for LINE-1 ORF1p for Gastric Cancer Detection
DF/HCC SPORE in Gastrointestinal Cancer Developmental Research Project
PI – Direct costs $50,000
The goal of this project is to evaluate our plasma LINE-1 ORF1p assays in larger cohorts of gastric cancers, including patients with earlier stage disease, evaluate tissue expression in early-stage gastric cancers, and develop stool assays for gastric and colon cancer.

Narrative Report

I am an early career physician-scientist working to build a molecular understanding of the human LINE-1 transposon and leverage transposon biology into novel strategies for early diagnosis, prevention, and treatment of cancer and autoimmunity. My interests have never strayed far from protein structure-function since my undergraduate thesis work applying optimization mathematics to computational protein design. My thesis work in Pharmacology at Johns Hopkins with Phil Cole and Jef Boeke clarified the role of the gut hormone ghrelin as a fat sensor modulating metabolism, rather than "hunger hormone", and developed a proof-of-concept ghrelin activation inhibitor that provided for glucose and weight control in mice. This work was recognized with publications *Science, JBC, and Bioorganic Chemistry*. A pilot experiment late in my graduate studies in the Boeke lab led me to change paths and study LINE-1 before returning to medical school. We discovered host factors critical in the LINE-1 lifecycle and developed novel systems and reagents to study LINE-1 that are in wide use and enable my current work. For this I was recognized with multiple publications, including one in *Cell*, and multiple research awards.

My interest in LINE-1 and its potential roles in cancer led me to residency and GI pathology subspecialty training at Massachusetts General Hospital, where I became interested in roles of LINE-1 in carcinogenesis and applications in translational research. I continue to practice clinically; I find it rewarding and find the interface between medicine and basic research scientifically inspiring. Indeed, as a resident, I identified and published evidence of a previously unrecognized pattern of acute lung injury and regeneration, which I later identified is a very rare adverse reaction to a common antibiotic (Bactrim). I remained active in basic research throughout clinical training, including publishing a paper building knowledge of L1-host interactions and cell biology (*Taylor et al., eLife 2018*). Following training, in 2018 I joined the laboratory of Dr. David Sabatini at the Whitehead Institute to learn cell biology and signaling, all in a world-class environment where I also mentored 6 students, preparing me well for an independent career.

To this end, I began my postdoctoral work studying the structure and function of mTORC2-Akt in growth factor signaling. Breakthroughs and novel chemical biological techniques soon led to structural and biochemical insights, and the project was recognized with an NIH K08 award was submitted to *Cell* for publication (submission date: 9/30/24). Following the closure of the Sabatini lab, I transitioned to semi-independence, with co-mentorship by Phil Cole and Kathy Burns, both recently relocated to Harvard. In this time, in addition to completing the mTORC2 project, I have since completed three major LINE-1 projects, bolstered heavily by the knowledge gained training in the Sabatini lab and techniques developed to study mTORC2. First, in a translational project now published in *Cancer Discovery*, I led a highly multidisciplinary team to discover that LINE-1 ORF1p expression pervasively marks the high risk precursor Barrett's esophagus in tissue, is far more pervasive in GI cancers and carcinogenesis than previously appreciated, and, collaboratively building on David Walt's Simoa technology, to develop novel, ultrasensitive plasma assays that detect attomolar levels of ORF1p. Plasma ORF1p is a highly specific 'pan-cancer' biomarker, shows potential utility in early detection and monitoring applications, and is prognostic in GI cancers. Secondly, I led a major collaborative effort that has determined the first structures of the LINE-1 ORF2 multifunctional reverse transcriptase protein (ORF2p), provided key mechanistic insights into polymerization, insertion, and activation of the innate immune system, and shed light on its evolutionary history. This work was recently published in *Nature*. Finally, in work under revision at *JBC*, I mentored two trainees in discovery and characterization of a novel mismatch cutting activity of the ORF2p endonuclease.